# MARINE REVIEW.

VOL. XII. CLEVELAND, O., DECEMBER 26, 1895. No. 26.

## Average Rates of Freight.

Average wild rates on ore during the past season were 73 cents from Escanaba, 92 cents from Marquette and $1.13 from ports at the head of Lake Superior. In the accompanying tables there is presented average rates of freight on iron ore, coal and grain. The averages of daily rates, or rates on wild cargoes, is made up by collecting from several shippers and vessel brokers their lists of charters during the season, from which a general list is prepared, that will include in nearly all cases actual charters for every day of the season. The sum of these daily rates divided by the number of days gives the average quoted. These averages are, then, what may be termed daily averages, and not the figures at which the entire tonnage of either coal or grain was moved. A large part of the ore moved from Ashland, Two Harbors and Duluth was covered by contracts at 80 cents for the full season, and that figure is accordingly put down as the contract rate from the head of the lakes. Few season contracts were made for ore to be moved from Marquette or Escanaba. The few engagements for the full season that were made were at 75 cents from Marquette and 55 cents from Escanaba. Vessels could have been secured in the spring at less than 75 cents from Marquette and even less than 55 cents from Escanaba, but as these are the figures at which some ore was actually covered they must be quoted as the contract rates from these ports. Following are the tables:

AVERAGE FREIGHT RATES, IRON ORE, PORTS NAMED TO OHIO PORTS.

| Year. | ESCANABA. | | MARQUETTE. | | ASHLAND AND OTHER PORTS AT THE HEAD OF LAKE SUPERIOR. | |
|---|---|---|---|---|---|---|
| | Wild or daily rate. | Contract rate. | Wild or daily rate. | Contract rate. | Wild or daily rate. | Contract rate. |
| 1876 | $0 86 | $1 20 | $1 35 | $1 50 | ..... | ..... |
| 1877 | 98 | 1 00 | 1 41 | 1 40 | ..... | ..... |
| 1878 | 81 | 90 | 1 22 | 1 30 | ..... | ..... |
| 1879 | 1 25 | 90 | 1 83 | 1 40 | ..... | ..... |
| 1880 | 1 70 | 1 85 | 2 26 | 2 75 | ..... | ..... |
| 1881 | 1 36 | 1 75 | 2 05 | 2 45 | ..... | ..... |
| 1882 | 1 04 | 1 40 | 1 26 | 1 75 | ..... | ..... |
| 1883 | 1 22 | 1 00 | 1 40 | 1 20 | ..... | ..... |
| 1884 | 87 | 1 10 | 1 08 | 1 35 | ..... | ..... |
| 1885 | 78 | 90 | 98 | 1 05 | $1 25 | $1 15 |
| 1886 | 1 28 | 1 05 | 1 51 | 1 20 | 1 78 | 1 20 |
| 1887 | 1 59 | 1 40 | 1 87 | 1 63 | 2 23 | 2 00 |
| 1888 | 1 05 | 90 | 1 30 | 1 15 | 1 43 | 1 25 |
| 1889 | 1 01 | 1 00 | 1 19 | 1 0 | 1 34 | 1 25 |
| 1890 | 89 | 1 10 | 1 07 | 1 25 | 1 17 | 1 35 |
| 1891 | 84 | 65 | 1 02 | 90 | 1 11 | 1 00 |
| 1892 | 74 | 1 00 | 98 | 1 15 | 1 15 | 1 25 |
| 1893 | 56 | 85 | 71 | 1 00 | 77 | 1 00 |
| 1894 | 46 | 60 | 60 | 80 | 78 | 80 |
| 1895 | 73 | 55 | 92 | 75 | 1 13 | 80 |

Charge to vessel for trimming and unloading 18 cents a ton.

Average ore rates for the entire period of twenty years: Escanaba, contract $1.05, wild $1.00; Marquette, contract $1.35, wild $1.30; Average for past ten years: Escanaba contract 91 cents, wild 91½ cents; Marquette, contract $1.09, wild $1.12; Ashland and other ports at the head of Lake Superior, contract $1.19, wild $1.30.

AVERAGE DAILY WILD RATES, SOFT COAL OHIO PORTS TO PORTS NAMED

| Year. | Milwaukee. | Escanaba. | Duluth. | Green Bay. | Manitowoc. |
|---|---|---|---|---|---|
| 1886 | $0 83 | $0 60 | $0 78 | ..... | ..... |
| 1887 | 1 06 | 72 | 89 | ..... | ..... |
| 1888 | 84 | 61 | 66 | ..... | ..... |
| 1889 | 54 | 49 | 52 | ..... | ..... |
| 1890 | 64 | 45 | 49 | ..... | ..... |
| 1891 | 61 | 52 | 49 | ..... | ..... |
| 1892 | 58 | 43 | 43 | $0 55 | $0 49 |
| 1893 | 48 | 40 | 38 | 50 | 41 |
| 1894 | 48½ | 39 | 37½ | 49½ | 48 |
| 1895 | 54 | 39 | 36½ | 50 | 51 |
| Average ten years, | 66 | 50 | 54 | | |

Chicago rate about same as Milwaukee.
Coal of all kinds shipped in net tons and handled without charge to vessel

AVERAGE LAKE FREIGHT RATES, HARD COAL, BUFFALO TO PORTS NAMED.

| | | | |
|---|---|---|---|
| 1886 | $0 87 | $0 62 | ..... |
| 1887 | 1 05 | 70 | $0 35 |
| 1888 | 86 | 65 | 41 |
| 1889 | 52 | 41 | 27 |
| 1890 | 62 | 43 | 33 |
| 1891 | 56 | 29 | 25 |
| 1892 | 59 | 43 | 27 |
| 1893 | 49 | 29 | 28 |
| 1894 | 46 | 25 | 25 |
| 1895 | 59 | 24 | 30 |
| Average for ten years | 66 | 43 | 30 |

Rate to Milwaukee about 5 cents less than Chicago, and Detroit rate about the same as Toledo rate.

AVERAGE DAILY RATES OF FREIGHT, GRAIN, CHICAGO TO BUFFALO.

| Year. | Wheat. | Year. | Wheat. |
|---|---|---|---|
| 1878 | 3.1 cents. | 1888 | 2.7 cents |
| 1879 | 4.7 " | 1889 | 2.5 " |
| 1880 | 5 7 " | 1890 | 1.9 " |
| 1881 | 3.2 " | 1891 | 2.5 " |
| 1882 | 2.5 " | 1892 | 2.2 " |
| 1883 | 3.5 " | 1893 | 1.8 " |
| 1884 | 2.1 " | 1894 | 1.3 " |
| 1885 | 2. " | 1895 | 1.9 " |
| 1886 | 3.6 " | | |
| 1887 | 4.1 " | Aver. eighteen years.... | 2.8 cents. |

Charges to vessels for shoveling, trimming and weighing grain foot up about $4.75 per 1,000 bushels.

## Congressional Committees.

The composition of committees of the house of representatives, as made up by Speaker Reed, has occasioned a great deal of comment among politicians, but lake interests have no cause for complaint. Out of seventeen members of the river and harbor committee, seven are from states bordering on the lakes. The chairman is Mr. Hooker of Chatauqua County, New York, whose district extends to the shore of Lake Erie. The appointment of Mr. Burton of Cleveland on this committee is especially pleasing to the Lake Carriers' Association, as it has been understood that Mr. Burton will give special attention to details of legislation in which the association is interested. Committees that will have most to do with lake legislation are made up as follows:

Rivers and harbors: Republicans—Hooker, New York, (chairman), Herman, Oregon; Stephenson, Michigan; Reyburn, Pennsylvania; Cooper; Wisconsin; Burton, Ohio; Barrett, Massachusetts; Reeves, Illinois; Towne, Minnesota; Dovener, West Virginia; Clark, Missouri; Walker; Virginia. Democrats—Catchings, Mississippi; Lester, Georgia; Clark, Alabama; McCulloch, Arkansas; Berry, Kentucky.

Railways and canals: Republicans—Chickering, New York, (chairman); Cook, Wisconsin; Leisenring, Pennsylvania; Warner, Illinois; Foote, New York; Lacey, Iowa; McEwan, Jr., New Jersey; Calderhead, Kansas. Democrats—McLaurin, South Carolina; Lockhart, North Carolina; McGann, Illinois; McKenney, Virginia; Otey, Louisiana.

Merchant marine and fisheries: Republicans—Payne, New York, (chairman); Perkins, Iowa; Hopkins, Illinois; Strong, Ohio; Griswold, Pennsylvania; McCormick, New York; Sinmpkins, Massachusetts; Minor, Wisconsin Democrats—Berry, Kentucky; Robbins, Alabama; Cooper, Florida; Fitzgerald, Massachusetts; Crowley, Texas.

Interstate and foreign commerce: Republicans—Hepburn, Iowa, (chairman); Fletcher, Minnesota; Sherman, New York; Wanger, Pennsylvania; Doolittle, Washington; Settle, North Carolina; Aldrich, Illinois; Joy, Missouri; Corliss, Michigan; Bennett, New York. Democrats—Price, Louisiana; Patterson, Tennessee; Bartlett, New York; Rusk, Maryland; Ellett, Virginia.

Naval affairs: Republicans—Boutelle, Maine, (chairman); Robinson, Pennsylvania; Hulick, Ohio; Hilborn, Colorado; Bull, Rhode Islsnd; Hanley, Indiana; Wilson, New York; Foss, Illinois; Dayton, West Virginia. Democrats—Cummings, New York; Meyer, Louisiana; Money, Mississippi; Hall, Missouri; Tate, Georgia; Hart, Pennsylvania.

Appropriations: Republicans—Cannon, Illinois, (chairman); Bingham, Pennsylvania; Grout, Vermont; Northway, Ohio; Stone, Pennsylvania; Arnold, Rhode Island; Hainer, Nebraska; Blue, Kansas; Pitney, New Jersey; Hemenway, Indiana; McCall, Tennessee. Democrats—Sayers, Texas; Dockery, Missouri; Livingston, Georgia; Robertson, Louisiana; Layton, Ohio; Bartlett, New York.

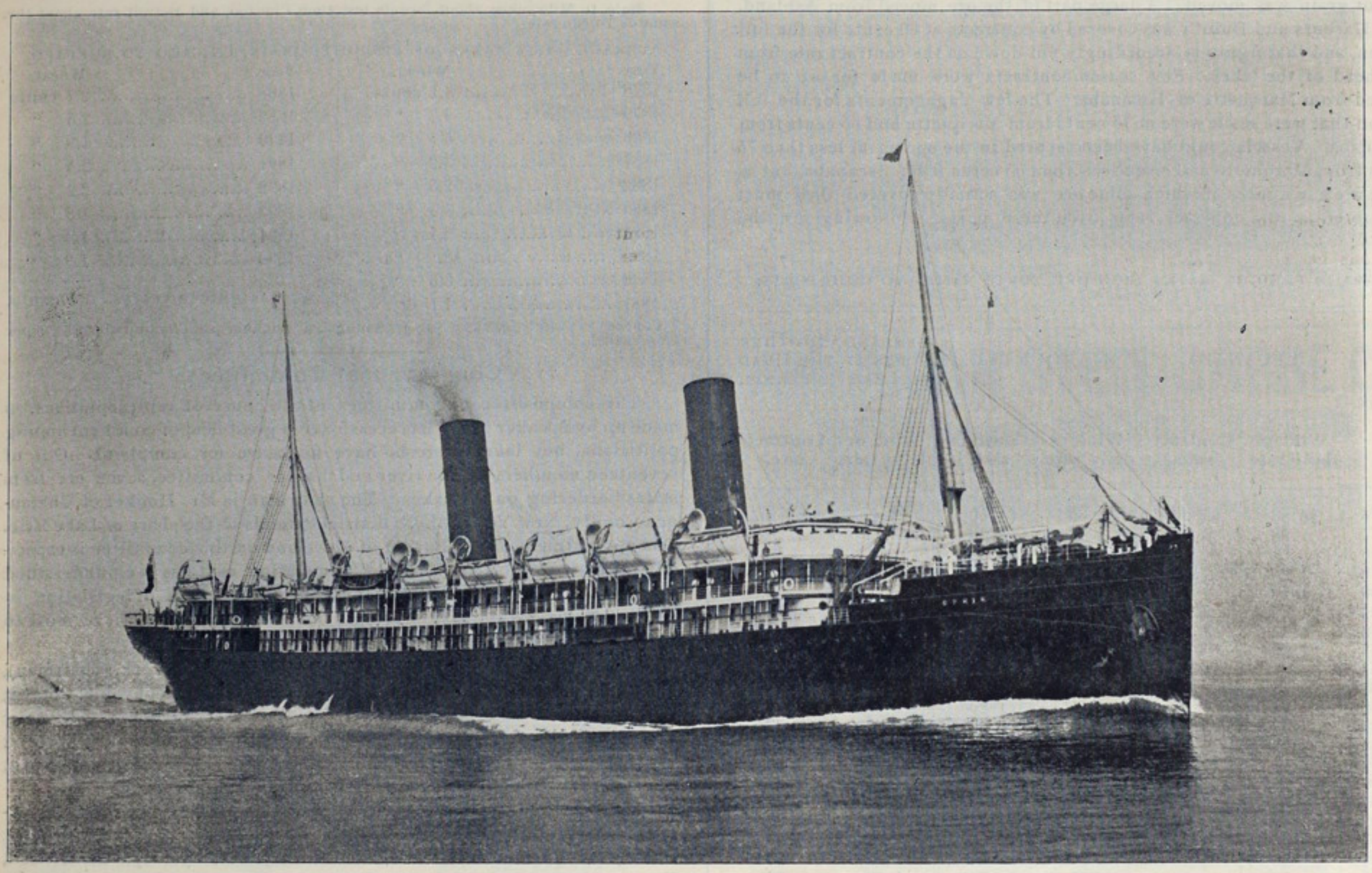
## Side-Wheel Steamer City of Buffalo.

In a supplement accompanying this issue, the REVIEW presents a very good picture of the Cleveland & Buffalo Transit Co's. new side-wheel steamer City of Buffalo, which was launched at the Wyandotte yard of the Detroit Dry Dock Co. on Tuesday last. The engraving is from a painting, which the REVIEW had prepared for the Cleveland & Buffalo company, and from which all pictures of the vessel as yet published have been made. The launch was attended by officials of the steamboat company from Cleveland and Buffalo and was made the occasion of some ceremony and informal festivities. Beam engines for the city of Buffalo have been built by the W. & A. Fletcher Co., Hoboken, N. J., a firm famous for the construction of this kind of machinery. As these engines are now about ready to be put into the vessel at Detroit, both builders and owners hope to find the ship ready for service immediately following the opening of navigation.

As the City of Buffalo will represent the best type of side-wheel steamer thus far constructed on the lakes, a full description of her will prove interesting. She is 308 feet over all, 298 feet on water line, 75 feet over guards, 17 feet 4 inches deep, and light will draw 9½ feet; loaded, 11½ feet. The hull is of ⅝-inch steel, tested for most rigid requirements, and is divided into eleven water-tight compartments, which are closed by automatic water-tight doors. The engines, built by the W. & A. Fletcher Co., Hoboken, N. J., are of the compound beam type, the high pressure cylinder being 52 inches by 8 feet stroke and the low pressure 80 inches by 12 feet stroke. The largest cylinder of this class of engines in a lake steamer at present is 68 inches, so that the new steamer will be by far the fastest on the lakes. The electrical outfit will include more than 1,500 lights, in addition to a search light. The paddle wheels are larger than those of any side-wheel steamer in this country, except the Fall River steamers. They are 30½ feet diameter and weigh 58 tons each. They are of the Clyde feathering type and do away with the usual vibration. The main shafts are 29 feet long and 24 inches diameter, and were forged by the Cleveland City Forge & Iron Co. Steam will be furnished the main engines and sixteen auxiliaries by six Scotch boilers, 12½ feet diameter by 12 feet long, fitted with the Howden hot draft system, which will add largely to their efficiency. Boilers are tested to 175 pounds, and the working pressure will be 125 pounds. The six boilers will weigh 250 tons and will carry about 250 tons of water. It is expected that this steamer will make the trip between Buffalo and Cleveland in about eight hours.

The main deck as far back as the passenger gangway is exclusively for freight, and will carry 800 tons of general merchandise. Immediately aft of this is the social hall. This is the first apartment entered by the passenger, and is to be furnished in light mahogany, highly carved with decorations equal to the grand saloon. Adjoining this room is the purser's office, steward's office, and baggage room. At the extreme stern is a spacious day cabin, adjoining which will be two cozy private dining rooms for the accommodation of private parties desirous of dining alone. The dining room will be reached by a grand stairway from the social hall; will be furnished in oak with high art decorations, and will seat 150 people. The kitchen and pantry will occupy a compartment just forward of the dining room, containing every device and requirement for the service of meals on the European plan. The grand saloon is 250 feet long and will contain two tiers of staterooms, around which will run a broad gallery. The lower portion of the saloon will be furnished in solid dark mahogany, with artistic designs and pressed leather pannelings; while the part above the gallery will be done in delicate tints and gold tracings. The furniture will be designed especially to harmonize with the general surroundings, and will be of mahogany with the finest of upholstering. There will be 160 commodious staterooms, besides six sumptuous parlors, with bathroom and every modern convenience, and 150 single berths—furnishing in all sleeping capacity in berths for 640 people.

The hull of the new steamer will be painted a dark green and the upper works white. Officers will be the same as were in the State of Ohio last season—John Edwards master, J. G. Randall chief engineer, A. D. MacLachlan purser and W. H. Thorpe steward. The City of Buffalo and the State of Ohio will make daily trips between Cleveland and Buffalo, a boat leaving each port every evening. The State of New York will be engaged on the route between Cleveland and Toledo.



OPHIR.—ELEGANT BRITISH-BUILT SHIP.

AN EXCELLENT LIBRARY FOR A MARINE ENGINEER, CHEAP—KEY TO ENGINEERING; WHAT AN ENGINEER SHOULD KNOW ABOUT ELECTRICITY; ENGINEERS' CATECHISM. ANY ONE OF THESE ARE WORTH A DOLLAR, BUT ALL THREE CAN BE HAD FOR $1. SEND TO THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. MONEY REFUNDED IF NOT SATISFACTORY.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE MARINE REVIEW AND LOOK OVER THE CHARTS AND SAILING DIRECTIONS OF LAKES SUPERIOR, MICHIGAN, HURON, ERIE AND ONTARIO, PUBLISHED BY THE HYDROGRAPHIC OFFICE.

## Traffic of Portage Lake Canals.

Through the kindness of Major Sears, corps of engineers, U. S. A., and the superintendent of the Portage lake ship canals, the REVIEW is enabled to print, in advance of publication by the war department, statistics covering the commerce of these canals during the year of 1895. Since these canals which pass through Keweenaw peninsula, Lake Superior, have been improved so as to admit of a draft equal to that of vessels passing through the St. Mary's Falls canal, the traffic has shown a wonderful increase. It is evident also that the copper business and other industries of the peninsula have also increased to a greater extent than in previous years. As shown by the tables that follow, the number of vessels passing through these canals during the past season was 1,731, the net tonnage of which was 956,779. Freight carried by these vessels aggregated 821,962 net tons. The tables also show local business and the business of tugs towing scows, rafts, etc. Tons of freight are in all csses net tons of 2,000 pounds.

STATISTICS OF VESSELS PASSING PORTAGE LAKE SHIP-CANALS, OF 1895.

| BOUND UP. | | BOUND DOWN. | |
|---|---|---|---|
| Steam, number | 770 | Steam, number | 489 |
| Steam, net tonnage | 495,485 | Steam, net tonnage | 216,605 |
| Sail, number | 335 | Sail, number | 137 |
| Sail, net tonnage | 178,203 | Sail, net tonnage | 66,486 |
| Coal, tons | 328,046 | Copper, tons | 47,672 |
| Grain, bushels | 26,828 | Grain, bushels | 40,517 |
| Mftd. iron, tons | 17,025 | Wheat, bushels | 261,210 |
| Salt, barrels | 45,028 | Flour, barrels | 816,837 |
| Limestone, tons | 12,341 | Iron ore, tons | 17,930 |
| Copper, tons | 22,232 | Pig iron, tons | 7,047 |
| Flour, barrels | 33,258 | Lumber, M feet | 72,687 |
| Misc. Mdse. tons | 123,395 | Misc. Mdse., tons | 9,434 |
| Total cargo, tons | 514,713 | Total cargo, tons | 307,249 |
| Passengers, number | 12,653 | Passengers, number | 12,156 |

RECAPITULATION.

| | Bound up. | Bound down. | Total. |
|---|---|---|---|
| Total number of vessels | 1,105 | 626 | 1,731 |
| Total net tonnage | 673,688 | 283,091 | 956,779 |
| Total freight, tons | 514,713 | 307,249 | 821,962 |
| Total passengers, number | 12,653 | 12,156 | 24,809 |

STATISTICS OF TUGS PASSING THROUGH PORTAGE LAKE CANALS WITH RAFTS, SCOWS, ETC.

| | Bound up. | Bound down. |
|---|---|---|
| Trips, number | 860 | 851 |
| Net tonnage | 27,253 | 26,378 |
| Vessels, number | 75 | 27 |
| Scows, number | 220 | 232 |
| Rafts, number | 112 | 226 |
| Booms | 166 | 156 |
| Logs, M. feet | 6,317 | 25,400 |
| Lumber, M. feet | 1,408 | 1,594 |
| Timber, M. feet | 9,914 | 22 |
| Cordwood, cords | 195 | 154 |
| Piles, number | ..... | 1,000 |
| Building stone, tons | 9,462 | 598 |
| Gravel, tons | ..... | 100 |
| Miscellaneous merchandise, tons | 558 | 910 |

LOCAL BUSINESS OF TUGS IN PORTAGE LAKE, SEASON OF 1895.

| | Bound up. | Bound down. |
|---|---|---|
| Trips, number | 673 | 674 |
| Net tonnage | 14,152 | 14,149 |
| Scows, number | 661 | 672 |
| Rafts, number | 15 | 2 |
| Booms, number | 4 | 18 |
| Logs, M. feet | 1,608 | 400 |
| Lumber, M. feet | 4,508 | 380 |
| Timber, M. feet | 1,025 | 1,130 |
| Charcoal, bushels | ..... | 19,700 |
| Cordwood, cords | 9,942 | 4,889 |
| Old iron, tons | 100 | ..... |
| Piles, number | 1,000 | ..... |
| Vessels, number | 1 | ..... |
| Railroad ties, number | 1,200 | ..... |
| Poles, number | ..... | 660 |
| Clay, tons | ..... | 530 |
| Coal, tons | ..... | 50 |
| Copper, tons | ..... | 600 |
| Brick, M | ..... | 30 |
| Miscellaneous Merchandise, tons | 240 | 1,181 |

STATISTICS OF VESSELS PASSING THROUGH THE UPPER CANAL, PORTAGE LAKE SHIP-CANALS, SEASON OF 1895.

| | Bound up | Bound down. | Total. |
|---|---|---|---|
| Steam, number | 500 | 229 | 729 |
| Steam, net tonnage | 426,981 | 165,530 | 592,511 |
| Sail, number | 226 | 85 | 311 |
| Sail, net tonnage | 123,648 | 39,557 | 163,205 |
| Total cargo, net tons | 323,219 | 262,842 | 586,061 |
| Passengers, number | 8,474 | 8,199 | 16,673 |

## Ship Yard Matters.

E. W. Heath of Benton Harbor, Mich., has closed a contract with the Green Dredging Co. of Chicago for a wooden tug to cost about $17,000. The vessel will be 85 feet long, 20 feet beam and 11 feet depth of hold.

The Crescent Ship yard, Lewis Nixon manager, Elizabeth, N. J., will build three steel canal steamers and ten steel tow barges for the Cleveland Steel Canal Boat Co., which operated a line of steel canal vessels during the past season between Cleveland and New York. Particulars of the contract have not as yet been given out but this information comes from a reliable source.

The Craig Ship Building Co., Toledo, has closed a contract for a large steel tug to tow the big Lake Michigan car ferries, built recently by James Davidson of West Bay City for the Wisconsin & Michigan Railroad Co. The tug will be very large and will be fitted with triple expansion engines. The Craig company also reports contracts for two wooden vessels but they are not as yet ready to give out particulars.

F. W. Wheeler & Co. of West Bay City, Mich., have added another contract to their large list of orders for big ships. They will build the steel car ferry upon which the Flint & Pere Marquette railway company has been figuring for some time past. Neither the builders nor the railway officials are as yet prepared to give out particulars regarding the vessel, but it is certain that the contract has been awarded to Wheeler & Co. This car ferry will be one of the finest vessels of her kind ever built in this country.

S. F. Hodge & Co. Detroit will furnish the cargo-handling machinery for the package freight steamer that is being built by the Union Dry Dock Co., Buffalo; also for the two package freighters being built at the Roach yard, Chester, Pa., for the New York & New London route. The steamer Norseman is undergoing at the Hodge works extensive repairs and alterations to her engines, including a new double crank shaft, which replaces the old single crank; new valve gear throughout, with steam reversing gear; a Dean independent condenser, in place of the old connected air pump, and a general overhauling.

Within the past few days the REVIEW has been advised of the following new orders in lake ship yards: Montreal Transportation Co., Kingston, Ont.—Three-masted wooden schooner, to carry about 60,000 bushels of grain; cost, about $50,000. Bertram Engine Works, Toronto, Ont.—Two steel steam vessels for Ottawa River Improvement Co., one of 141 feet keel and the other 130 feet; cost, $35,000 to $40,000 each. Marine Iron Works, Chicago, Ill.—Five yachts and small steam vessels, to cost in all $14,250. Calvin Co., Garden Island, Ont.—Paddle towing steamer 125 feet long, to cost $15,000. J. Martel, Saugatuck, Mich.—Schooner yacht and steam yacht, to cost $5,000 each.

In order to make room for other work, building operations on the Wilson Transit Co.'s new steamer has been hurried. She was launched on Monday last and named W. D. Rees. This vessel is now the largest ship afloat. Other steamers that are being built under late contracts are larger than she is but they are as yet on the stocks. She is 395 feet on the water line, 415 feet over all, 45 feet beam and 28 feet depth. The channel system is followed in her construction. Her water bottom is 5 feet deep and is divided into eight compartments. Houses, built in the extreme forward and after parts of the vessel, are the regular barge style, leaving an open deck space for twelve hatches. Engines are of the triple expansion type having cylinders of 23, 38 and 63 inches diameter with a common strke of 40 inches. Two boilers of the Scotch type, 14 feet in diameter and 13 feet long, will furnish steam at 170 pounds pressure.

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War talk has caused naval bureau chiefs to urge the building of six instead of two battle ships under the plans that have just been considered by the department. A bill with this end in view has been introduced by Senator Hale of Maine. It is claimed that in view of the low figures of the bids just received at the recent opening it would be greatly in the interest of economy to accept all of the bids, and according to this plan the Newport News company would be given the contract for two of the ships, the Union Iron Works of San Francisco a contract for two and the Cramps also a contract for two.

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ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.

## More Argument in Favor of Dams.

Agitation in congress of the problem of raising lake levels by means of dams is again bringing out discussion from engineers in various parts of the country. F. S. Dewey of Alpena, Mich., has been writing to Detroit newspapers on the subject. He argues that with the vast forests of the northwest largely denuded by ax and fire, the past furnishes no basis of calculation for the future. Niagara river can do just as much as it ever could, but the clouds apparently cannot. Unless this disproportion is restored, either by more rain or less outflow, it is plain, he claims, that the lakes will remain permanently low.

"The flow of water over the Niagara falls," says Mr. Dewey, "amounts to about 380,000 cubic feet per second. . By a simple arithmetical calculation it is found that this outflow alone is sufficient to bring down the level of all the upper lakes 8 feet and 4 inches in a single year, provided, of course, all sources of supply were arrested. Conversely, if the rainfall was up to the annual average and the outflow at Niagara were entirely stopped for one year, the water level would be raised by the same amount, and leaving Lake Superior out of the calculation, as it would not be appreciably affected, the level in all the other upper lakes would be raised on an average more than 12 feet. But since the Detroit river would continue its flow, though with a constantly diminishing volume, Lake Erie would rise more rapidly and higher above its normal level than Lake St. Clair, and Lake St. Clair in like manner than Huron and Michigan.

"Again, if the St. Clair river at Fort Gratiot were stopped and the water in Lakes Huron and Michigan were held back, all the water below would become shallower until the flow of the Niagara would become reduced to about one-fourth of its present volume. Even a partial obstruction at the foot of Lakes Huron, while tending to deepen the harbors above, would just as surely tend to lower the water below, decreasing the flow through the connecting channels and rendering navigation still more difficult and dangerous than it now is. So again, any diminishing of the flow at Niagara would raise the waters of Lake Erie to a damaging height before its effects would reach the St. Clair flats.

"Any successful plan must be substantially the same as that adopted by nature if nature's relative levels are to be maintained. It is not sufficient to arrest the flow in one channel; it must be arrested in all; but more especially at the first available channel below the main obstructions to navigation, that is below the channel connecting Erie and Huron, or at Niagara river. This is reasonable and according to nature's teaching. A 10 per cent reduction at this point would tend to raise the water about 15 inches in a year. Just above the rapids, a mile or more below Grand island, the river narrows down so that either wing or submerged dam, or a combination of the two, could be made very effective, and would offer no hindrance to navigation. The flow could be further lessened by filling in with rock at other suitable points between there and Lake Erie.

"In like manner could the channels of both the Detroit and the St. Clair rivers be reduced at such various points as would offer the least hindrance to navigation by the consequent increased velocity of the current. By a proper application of this principle it is plain that any reasonable water level may be cheaply and quickly reached and easily maintained for all time to come. As a corollary it may be easily shown that a reduction of the outflow of Lake Erie by the amount of only 5 per cent would much more than provide for all the water required for the Chicago drainage canal, aud would furnish a constant annual increment as long as the 5 per cent reduction was maintained.

"Not only does this plan furnish a cheap and complete solution of the question of lake levels, but out of the immense volume running to waste at Niagara enough can safely be spared without any hindrance to navigation to furnish water for several drainage canals like that at Chicago."

## Senator Brice is Working on the Question of Lake Levels.

As indicated by the following letter to the REVIEW, Senator Calvin S. Brice of Ohio is evidently very much interested in the subject of improving lake waterways by regulating the levels near the stage of high water:

"The issue of your valuable paper of Dec. 12 contains an article headed 'Senator Brice Interested in Lake Levels,' in which there is quite a lengthy quotation from a statement made by a civil engineer, who has given a great deal of study to this subject. Is it consistent for you to divulge the name of this engineer? If so, I shall be pleased to have it, as I desire very much to enter into correspondence with him respecting the subject on which he is quoted. I have no doubt he possesses much information that will be of great value to me in the consideration of the question of controlling the levels of the great lakes, which will come before congress in the very near future.

"In this connection, I would be pleased to have a copy of the issue of your paper for Sept. 7 and 21, 1893, and Nov. 1 and 8, 1894, each of which is said to contain an article on this subject. If you have any other data on this matter of any kind, I shall be greatly obliged if you will send it to me—especially any data with reference to whether there is any difference in altitude between the levels of the lakes or any of them at their heads and at their outlets."

The issues of the REVIEW referred to by Senator Brice, all of which have been sent to him, contain articles on this subject by Gen. Poe, Geo. Y. Wisner of Detroit and Mr. Wheeler, late superintendent of transportion in the Cleveland chamber of commerce.

## A Few Hints to the Army Engineers.

Editor MARINE REVIEW:—It should have been apparent that when certain army engineers set out to demonstrate the enormous injury to lake shipping through an alleged lowering of 3 to 6 inches, on account of the sanitary canal at Chicago, that they had committed themselves to a line of argument which showed enormous benefits to be derived from lake regulation. These gentlemen are now in position to acknowledge the propriety of a control of lake levels on its intrinsic merits, apart from any scheme of diversion of waters for canal purposes.

The Lake Carriers's Association has also petitioned for channels of double the present width at Sugar island rapids and the Middle Neebish on the Hay lake route. There is a fall of 2 feet in the St. Mary's river, between the locks and Lake Huron, and dykes were constructed alongside the cuts through these rapids, in order to prevent the lowering of the water at the "Soo" and to maintain the depths on the miter sill of the locks. It may have occurred to some of the officers that to double the width of these channels will produce an effect in lowered water surface which the original plans did not provide for; in fact, it might appear that they had considered a 300-foot channel as meeting the ultimate necessities of commerce. If so, judicious lake regulation would permit the wider channels, without making the lowered suface so apparent.

If the engineer corps is to put itself in line with the movement for deeper and wider channels, it must of necessity acknowledge the utility of lake regulation, and its very recent awakening on the subject does credit to its good, though somewhat belated, sense. I. K.

Buffalo, Dec. 24, 1895.

## Navies of Great Britain and the United States.

Following is a comparison of vessels of war in service or now under construction in Great Britain and United States:

| | United States. | Great Britain. |
|---|---|---|
| Battleships | 8 | 60 |
| Coast defense vessels | 20 | 11 |
| Armored cruisers | 2 | 29 |
| Protected cruisers | 13 | 74 |
| Cruisers | 20 | 92 |
| Gun vessels | 17 | 16 |
| Torpedo vessels | 1 | 34 |
| Total vessels | 81 | 316 |
| Torpedo boats | 9 | 251 |
| Grand total | 90 | 567 |

The total force of officers and men in the British navy is 88,850 against 13,460 in the United States navy.

## Deep Waterways Commissioners.

The Canadian commission was officially gazetted on Dec. 14, under the order-in-council dated Nov. 30. The order-in-council is virtually a duplicate of the law creating the American commission. The appointees as already announced, are O. A. Howland, lawyer, Toronto; T. C. Keefer, civil engineer, retired, of Ottawa; and Thomas Monro, chief engineer, Soulanges canal. The meeting to organize the Canadian commission is called for Ottawa in Christmas week. The first meeting of the American commission is called for Detroit the first week in January. The meetings have been delayed on account of diplomatic notices which require time.

## Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Dec. 21, 1895:

| | Wheat, bushels. | Corn, bushels. |
|---|---|---|
| Chicago | 21,213,000 | 1,001,000 |
| Duluth | 7,655,000 | ..... |
| Milwaukee | 879,000 | ..... |
| Detroit | 365,000 | 27,000 |
| Toledo | 983,000 | 124,000 |
| Buffalo | 3,368,000 | 225,000 |
| Total | 34,453,000 | 1,377,000 |

As compared with a week ago, the above figures show at the several points named an increase of 1,423,000 bushels of wheat and 201,000 bushels of corn.

## Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

551,363. Boat. Francis H. Church, Kansas City, Mo., assignor of one-half to John R. Kirby, same place. Filed Aug. 30, 1895. Serial No. 561,055.

Claim—In combination with a boat, a compressed air cylinder located therein, a pipe leading from said cylinder, a valve connected to said pipe, a cross pipe extending from each side of the valve out through the opposite ends of the box in which they are located, flexible connections between the ends of said pipe, and air sacks arranged along the sides of the boat.

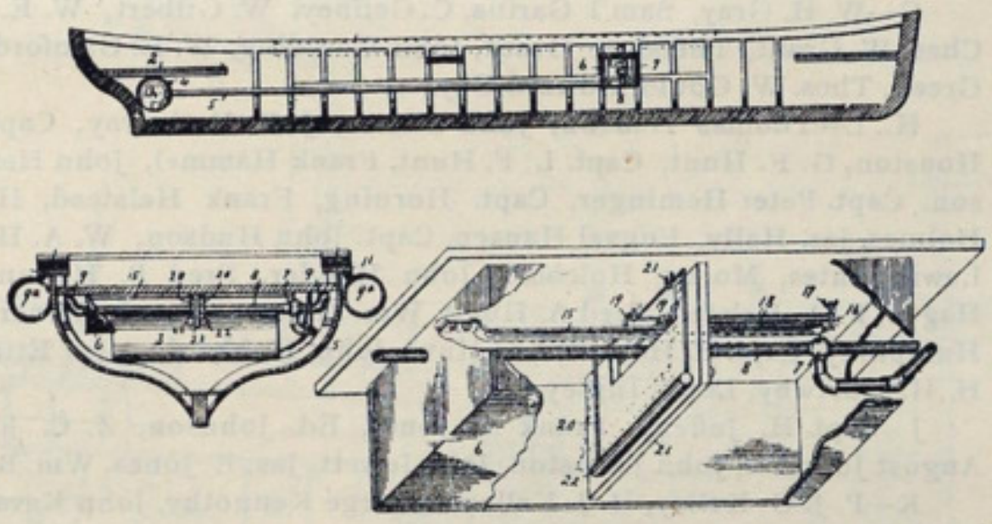
551,559. Stern-Frame and Rudder for Vessels. Joseph R. Oldham, Cleveland, Ohio. Filed Mar. 23, 1895. Serial No. 542,959.

Claim—The combination with a vessel, of the stern frame comprising the lower forward portion and the upper rear portion, the horizontal connection formed with a gudgeon, of the rudder having a forward extension, the pintles, the rudder-stock, the stop casting or forging having inclined lugs, the band embracing the upper pintle, and secured to the rudder, and the rudder-stock.

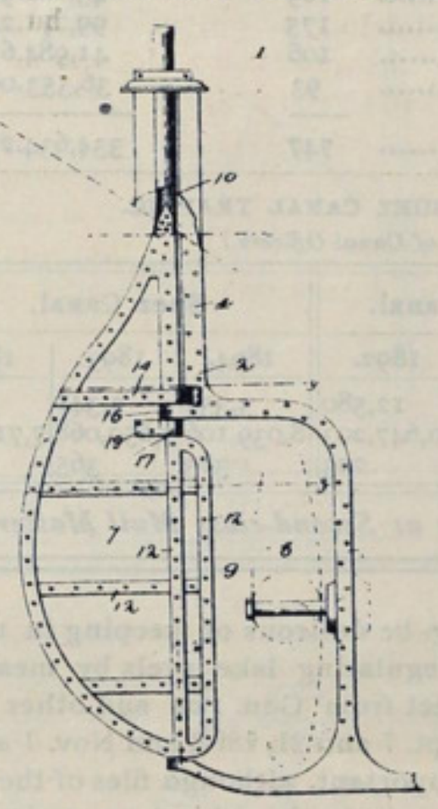
551,647. Propeller-Wheel. Elisha J. Parker, Dallas, Tex. Filed Aug. 24, 1895. Serial No. 560,374.

Claim—A propeller consisting of a hub, or sleeve, having flat wings, or buckets mounted thereon, a concentric band to which the ends of said wheels are attached, an intermediate series of flat wings between said bands and a second, concentric band, and an external series of flat wings between the latter band and an external, concentric band, the wings in the intermediate and external series being of greater dimensions than those in the adjacent inner series.

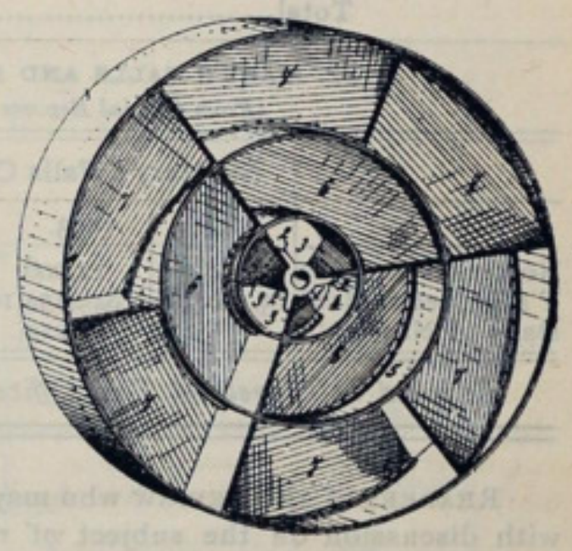
551,363. BOAT.



551.599. STERN-FRAME AND RUDDER FOR VESSELS.



551.647. PROPELLER-WHEEL.



## The Braender Bilge Pump.

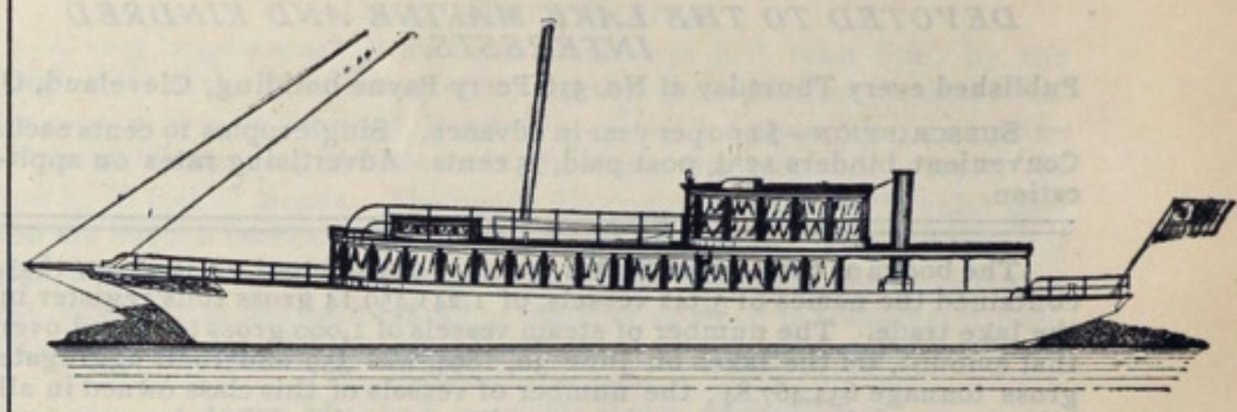
H. A. Magoun, superintendent of the Starin Ship Yard and Iron Works, writes as follows to Phillip Braender: "We have had for some weeks past two of your automatic bilge syphons on the steamer Erastus Corning. They have been working satisfactorily. It was found shortly after they were put in that the boat could be loaded with several tons more freight than formerly."

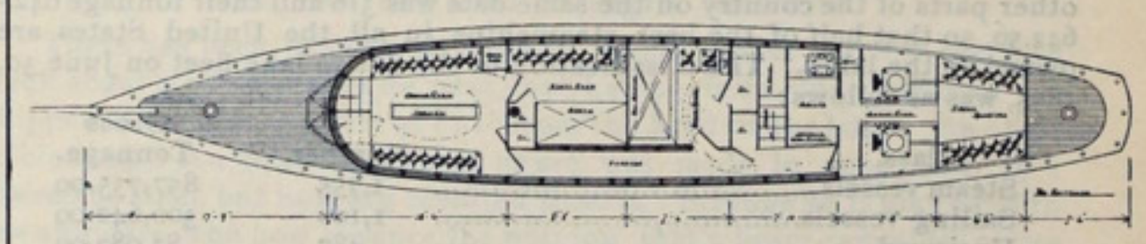
The chief engineer of the steamer Corning, R. W. Trim, says that the consumption of steam is inappreciable, and that the syphon never fails to work when the water rises high enough to lift the float. Its construction, he adds, being so very simple, it is hardly possible for it to get out of order. He recommends it very highly. There is no doubt that it would prove valuable on a large number of lake steambarges and save the wetting of grain cargoes.

Walfred Sylven of the light-house service, who has superintended the construction of government vessels on the lakes, writes that the specifications for light-ship No. 67 contains the following: "There shall also be fitted a Braender automatic bilge syphon, No. 3, connected to main and donkey boiler, complete in working order."

## A Very Large Naptha Yacht.

The REVIEW has referred to a yacht 76 feet over all, which is being built at the works of the Gas Engine & Power Co., Morris Heights, New York City. The builders now send us a description of the vessel, which is the largest craft as yet built for equipment with naptha power. The yacht is for Mr. Alfred Van Sant Voord, a prominent New York yachtsman, owner of the unique side wheel steam yacht Clermont and proprietor of the Albany Day Line, Hudson river. Mr. Van Sant Voord has also owned and built many other boats, in all of which will be found original ideas and peculiarities making them especially desirable for the





work intended. This naptha yacht will be used for his winter cruising in Florida, and is designed and arranged to meet the condition of the sonthern climate, and afford the greatest possible degree of comfort for guests. Especial attention has been given to ventilation. Windows are provided with fine screens to prevent the intrusion of obnoxious insects found in the south.

The vessel's length over all is 76 feet, beam 12 feet, 6 inches, and draught only 3 feet. The accompanying deck plan shows the interior of the vessel. There are two commodious staterooms, one fitted with single bunk, and the other to have double berths. There is also a large saloon and dining room, galley and quarters aft of the engine for the crew. The pilot house on top is well astern and contains quarters for the captain. A stairway from the lower apartments to the pilot house leads through to the roof of same, which will be utilized as an upper deck. A captain, engineer and cook make up the crew.

The yacht will be equipped with two 12-horse-power naptha motors, and will have fuel capacity for a run of 500 miles. She will have in addition an auxiliary sail rig, which will be used if required.

## Trade Notes.

A neat catalogue has been issued by the Hilles & Jones Co., Wilmington, Del. The cover illustration is rather striking, showing iron works of a building in course of construction. The lettering is made up of steel shapes and even the tube in which the catalogue is mailed is an imitation of a riveted pipe.

The Alexander Smith & Sons Carpet Co. of Yonkers, N. Y., has placed the contract for their new dye house building with the Berlin Iron Bridge Co. of East Berlin, Conn. The building is 60 feet wide and 172 feet long the steel roof trusses being arranged to carry cars on the lower chord for moving material about the building.

LAKE MICHIGAN ON ONE SHEET, THE FOURTH OF THE HYDROGRAPHIC OFFICE SERIES OF CHARTS, IS NOW IN PRINT AND MAY BE HAD FROM THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING. PRICE 75 CENTS.

MARINE REVIEW

*DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.*

**Published every Thursday at No. 516 Perry-Payne building, Cleveland, O**

**SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.**

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

| Class. | Number. | Gross Tonnage. |
|---|---|---|
| Steam vessels | 1,755 | 857,735.00 |
| Sailing vessels | 1,100 | 300,642.00 |
| Unrigged | 487 | 83,082.00 |
| Total | 3,342 | 1,241,459.00 |

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

| | Number. | Net Tonnage. |
|---|---|---|
| Year ending June 30, 1891 | 204 | 111,856.45 |
| " " " 1892 | 169 | 45,168.98 |
| " " " 1893 | 175 | 99,271.24 |
| " " " 1894 | 106 | 41,984.61 |
| " " " 1895 | 93 | 36,353.00 |
| Total | 747 | 334,634.28 |

**ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.**

*(From Official Reports of Canal Officers.)*

| | St. Mary's Falls Canal. | | | Suez Canal. | | |
|---|---|---|---|---|---|---|
| | 1894. | 1893. | 1892. | 1894. | 1893. | 1892. |
| No. vessel pass'ges | 14,491 | 12,008 | 12,580 | 3,352 | 3,341 | 3,559 |
| T'n'ge, net registd | 13,110,366 | 9,849,754 | 10,647,203 | 8,039,106 | 7,659,068 | 7,712,028 |
| Days of Navigat'n | 234 | 219 | 223 | 365 | 365 | 365 |

*Entered at Cleveland Post Office as Second-class Mail Matter.*

READERS of the REVIEW who may be desirous of keeping in touch with discussion on the subject of regulating lake levels by means of dams will find articles on this subject from Gen. Poe and other well known engineers in our issues of Sept. 7 and 21, 1893, and Nov. 1 and 8, 1894. These articles are especially important, although files of the REVIEW for two years past contain references to the subject on various occasions. The first annual report of International Deep Waterways Association, published in Cleveland recently by Secretary F. A. Flower, whose address is West Superior, Wis., also contains exhaustive articles on the subject. This matter is certain to demand considerable attention from the present congress. Gen. Craighill, chief of army engineers, seems disposed to approve the dam project. In a letter to Hon. Mathew Griswold, member of congress from Erie, Pa., he adds this note to a favorable opinion on the subject from Major. Marshall, engineer at Chicago: "Major Marshall, the officer whose opinions are submitted to you, is stationed at Chicago and has given much study to the navigation of the lakes and all that relates to that very important subject. There is no one whose opinions concerning it are entitled to greater consideration."

SENATOR MCMILLAN is again lending a hand to the revenue cutter service in the matter of securing modern ships for that service. He has introduced a bill for the construction of another vessel for the lakes. The ship is to be of the first class, similar to the one now under construction in Cleveland. As Mr. McMillan is a member of the commerce committee of the senate, to which measures of this kind are referred, it is quite probable that an appropriation for this second vessel will be secured.

JUST keep an eye on Mr. Burton of Cleveland in the present congress. He enters upon a second term with a full knowledge of matters pertaining to lake commerce and with an evident intention of making a record along this line. As a member of the river and harbor committee his influence will be greatly increased. He knows now the ins and outs of committee work. A disposition to curtail appropriations of all kinds may act against the aims he has in view but he will in any event prove an efficient representative of lake interests.

## Unclaimed Letters.

About 300 letters, addressed to employes of lake vessels remain unclaimed in the Detroit postoffice. They were accumulated while the river service was in operation during 1895. Following is the list:

A—George Anderson, Alonzo Arnold, J. L. Azonor, John Allen, H. T. Archer, C. Albinson, Jos. H Antherson.

B—Albert Barr, Mrs. Emma Barrett, Capt. L. Bang, Mrs. Binnie, J. P. Bedford, Geo. Burke, Chas. Bertrand, C. I. Bertrand, Albert Bates, Geo. Burke, John Bubeck, Capt. Barnes, Louis Bowein, Wm. Brurme, T. Burger, Lufger Beaumen, Geo. L. Brackett, Ledger Beauvais, 2, Edw. Black, Wm. Blackstone, Chas. H. Beach, Chas. Burk, Wm. Bridger, Burt Brake, Frank Butler, Albert Brassans, S. Braund, Thos. Burns, Henry Birch, Chas. H. Burke, Willey Bisson, Frank Beatty, C. H. Bellamy, W. S. Brown, Walt. Buchanan, Mrs. Jo. Braymen.

C—Capt. Peter Cartwright, Mrs. Lucy Cane, Mrs. Maud Carpenter, Emmett Calhoun, Capt. Benj. Calhoun, Miss Carrie Chandler, Joseph Cissoe, John H. Cook, Miss J. Cronan, J. M. Campbell, Birt Craner, Will H. Carpenter, W. M. Chamberlain, Capt. A. Chrissansen, J. Cronan, Thos. Cooney, Henry Connoll, H. S. Connoll, Ed. Collier, Capt. Jas. V. Crawford, E. H. Childs, Homer Cowell, H. C. Crane, T. M. Corniff, Thomas Corniff, Robert J. Close, J. Cronan, W. J. Cunningham, Charley Cummings.

D—G. B. Davis, Wm. Downs, Harve Duncan, Daniel Davis, Harvey E. Duncan, Harve Duncan, A. J. Dwyer, E. Dobson, Edwin Davidson, H. J. Denny, E. M. Donahue, O. H. Drillingham, Wm. R. Donaldson, Fred Dusch.

E—Mr. Edmunds, Elmer Ellsworth, Ed. Egan, W. T. Ellis, J. B. Elliott, Frank Endres, Cyrus H. Evans, Thos. Elliott, A. Leonard Erickson, Jno. A. Erwin.

F—W. J. Fitzgerald, Fred Fort, Thos. Fulcher, Dan Fox, Frank F. Field, Robt. Ford, Herbert Finigan, Harry Fay, W. H. Foster, Mrs. Bell Flynn, E. M. Foster, E. M. Foster, W. Fitzpatrick, Archie C. Ferguson, W. Fitzpatrick, Capt. Hovas Fisher, Jno. F. Finnegan, John Finnegan, Mrs. Anna Ford, G. J Fuhrman, J. B. Foote.

G—W. H. Gray, Sam'l Garina, C. Gaffney, W. Gilbert, W. E. Geary, Chas. W. Grant, Theodore Grant, John Goulding, W. E. Gamford, Perry Green, Thos. W. Gould, Edward Gay.

H., I.—Thomas Hanson, John Hanna, J. K. Hathaway, Capt. Geo. Houston, G. F. Hunt, Capt. L. F. Hunt, Frank Hammel, John Hendrickson, Capt. Peter Heminger, Capt. Horning, Frank Halstead, Harry F. Holmes, Jas. Hally, Fugval Hausen, Capt. John Hudson, W. A. Hazzard, Lewis Hutes, Morley Holcomb, John Hodder, Fred B. Haunn, John Hagan, F. A. Halsted, Fred A. Huett, Wm. Harmon, Frank Hainer, Linus Humphrey, Capt. F. Hebner, Lee Hunt, John Hubbard, Miss Etta Huse, H. H. Hurtwby, Lewis Ingley.

J—Capt. H. Jeffeny, Frank A. Jones, Ed. Johnson, Z. C. Johnson, August Johnson, John Johnston, John Jewett, Jas. E Jones, Wm. B. Jones,

K—P. J. O. Kelley, M. J. Kelley, George Kennothy, John Kavanaugh, Chas. Kearn, Fred Kohler, Wallace King.

L—C. M. Leet, Norman Lang, James Labelle, Len LaFay, Jos. E. LaFay, Lewis Larson, Miss Sadie Lawrence, F. P. Lewnan, Daniel Larssen, Alex. Lozen, Mrs. Light, J. M. Larry.

M—Chas. N. Mermen, Richard Meshn, Thos. M. Moor, Henry Meloche, Wm. Morrow, Alex. Monhe, Albert Merrill, Frank Moller, Harny Martin, Jno. R. Maitland, H. Murdock, Paul Mallette, Alex. Montie, Edward Magner, Bert Mordin, Lena R. Marks, Edward Martin, Chas. Mennuir, Sheldon Miller, Jas. McCannell, Jas. McKinley, Edward McAaron, Ed. McFarland, Donald McKay, P. B. McCabe, S. B. McCann, Capt. J L McDowell, Mrs Jas. McCann, Kennie McKay, Roderick McLeod, John MacDonald, Jas. McMahon.

N—A. Nelson, Barney Nelson, Charley Nelson, Wm. Nicholoin.

O—Mrs. Ida O'Brien, John Osterman, Patrick O'Connor, Kate Onella, Buss Olson, Wm. Onesinie Oger.

P, Q—Mr. Parsons, Peter Paulsen, Capt. P. A. Peterson, Miss Anna Potter, Capt. F. L. Perin, Etta E. Peltier, Jos. Phelps, Daniel Prien, Eugene Peltier, Capt. Wm. Quinlan.

R—Miss Annie E. Ridey, Joe. Ross, Julius Robinson, Miss Clara Reidmaher, Reginald Rainey, Fred Rodloff, James Robertson, G. A. Rivard, Chris Rumsey, Stephen Roe, Aubrey Rivard.

S—Clarence E. Smith, Capt. Robert Seeley, Geo A Symes, Mrs. Annie Smith, G. P. Smith, H. Smith, Charley Storey, Fred Stevens, C. E. Sayre, W. F. Sutherland, Vincent Stack, Geo. A. Sharen, Theodore Straight, Capt. A. Swelgrove, Frank J. Smith, J. J. Staley, Edward Sullivan, Daniel A. Sullivan, Vincent Schorr, Capt. E. P. Spear, Leonard F. Schwacofer, Jas. N. Smith, Wm. H. Stone, A. A. Simmons, Capt. Geo. A. Symes.

T, V—Fere Trombley, G. L. Thompson, Mr. Thompson, Fred Telo, Capt. E. M. Titus, Capt. P. Telfer, Th. Tloentz, Capt Ben Tripp, George Thompson, Henry Thompson, Byron Tucker, Joseph Vincent.

W, Z—Joseph Warning, S. P. West, Henry C. Wallace, Anthony Ward, Walter Woodruff, J. M. Wilson, Jesse L. Wilson, Ernest Witte, Wm. Watts, Chas. Williams, Thomas Winn, Eugene Wood, Frank E. Westzman, George Willis, Evertt Zwemen.

## The New Goodrich Line Steamer.

There is presented on this page an longitudinal section of the new steamer being built for the Goodrich Transportation Co., Chicago, by Burger & Burger, Manitowoc. A detailed description of this vessel, as she will appear when completed, was given in the REVIEW of Nov. 21, 1895, and we have only to add that the contract for cabins and all joiner work has been given to Mr. John Schroeder of Manitowoc, who built the cabins of the passenger steamer Indiana and City of Racine.

## Around the Lakes.

Manager Elsey of the Cleveland Tug Co. will spend a part of the winter in California, leaving Cleveland about Jan. 15.

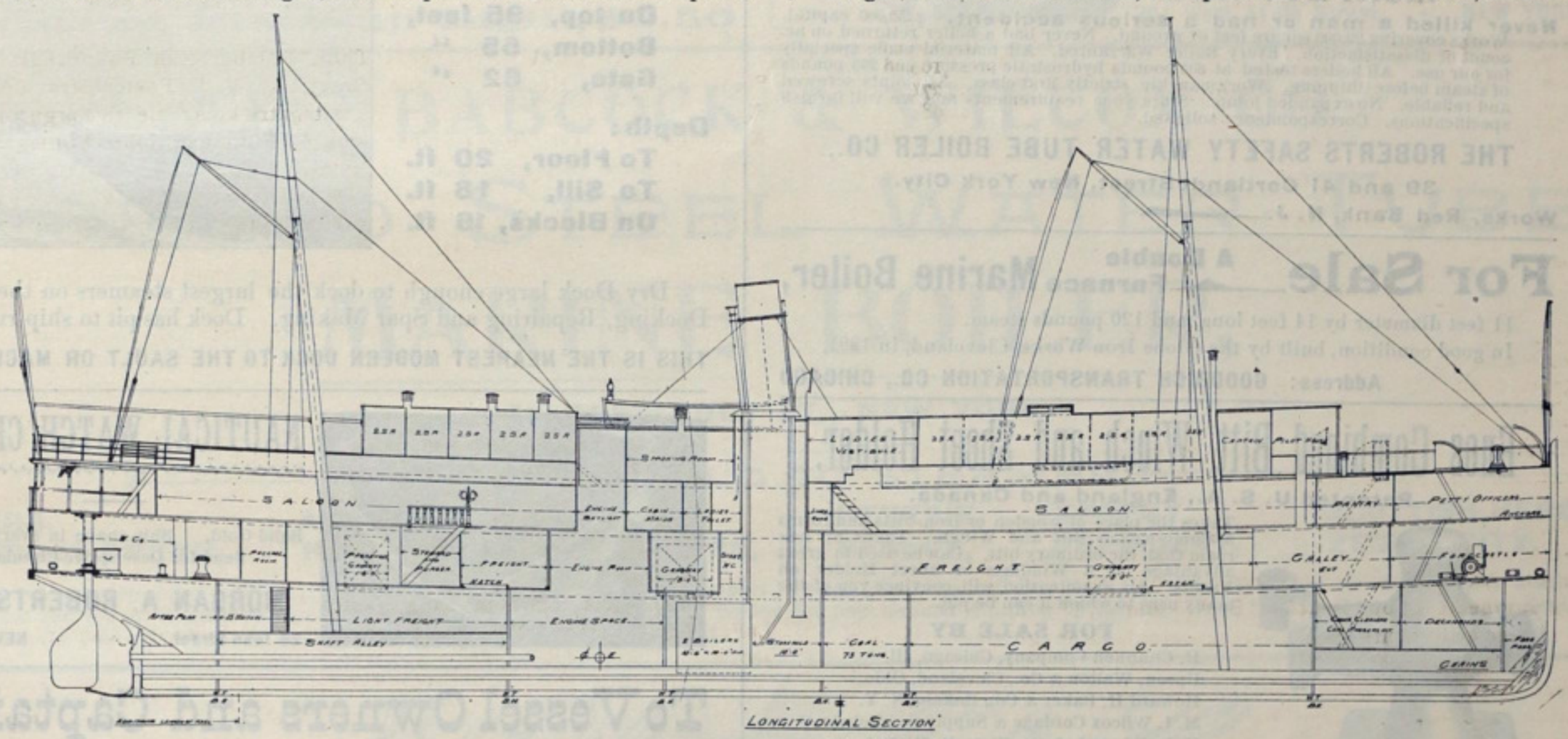
Capt. John McNeff, who has been for several years in the steamer Germanic, will sail the steamer City of Glasgow next season.

F. W. Wheeler & Co. of West Bay City, Mich., have recently added two McMyler hoisting machines to their ship yard equipment.

Vessels laid up in Cleveland number 115, against 100 a year ago. The capacity of the freight vessels in the list—Lake Michigan draught—is 192,700 net tons.

The steamer Fred Mercur enjoys the distinction of having been the last vessel to reach Buffalo from the upper lakes this season, She arrived at 2 p. m., Dec. 21.

Although shipments of hard coal to Lake Superior during the past season were somewhat less than the shipments in 1894, the movement out of Buffalo to Lake Michigan, Lake Superior and intermediate points aggregated 2,626,768 net tons, against 2,485,255 tons in 1894, 2,703,673 tons in 1893 and 2,852,133 tons in 1892.




NEW GOODRICH LINE STEAMER.

The Chicago board of marine underwriters has fixed the following rates on grain cargoes loaded before Feb. 1: To Port Huron, 90 cents per 100; Lake Erie. $1; Lake Ontario and Ogdensburg, $1.15; Montreal, 1.25. On boats below A2 rating, rates are 25 cents higher all around. Line boats of A2 rating take A1 rates;

The action of the Hursley Tug Co., Sault St. Marie, in paying a bigger price for the schooners Moonlight and Kent, ashore near Marquette, than could have been secured for them when they first went on the beach, would indicate that there are some vessel owners who still entertain hopes of profits for a few years to come, even in the older class of wooden vessels.

Steamboat captains familiar with the north shore of Lake Superior will be surprised to learn that near Jack Fish bay, on the Canadian Pacific Railway, a very rich gold mine is said to have been discovered. Stories regarding the mine are to the effect that specimens of gold are so "marvelously rich as to make one's head almost swim." A local company in Port Arthur and Fort William has been organized to work the property. Mayor McKellar of Fort William and his brothers are leaders in the company.

A short article in the REVIEW of Dec. 5, regarding the new ore railway that is being built between Ishpenning & Marquette, contained a statement to the effect that mining companies interested in the road would furnish "8,000,000 to 10,000,000 tons of ore per year." This was of course a typographical error, and anyone having a knowledge of the ore business would readily understand that "800,000 to 1,000,000 tons" of ore was meant, but some of the enterprisiug papers of the mining region that copy matters of this kind without credit swallowed the thing, big figures and all.

## Large Stern Frame.

A very large wrought iron stern frame has just been built by the Paterson Iron Co. of Paterson, N. J., for the Cromwell line steamer under construction at Newport News, Va. Outside measurements of the frame, which was forged under a 10-ton steam hammer, are 21 feet 2 inches by 28 feet 10 inches. The inside dimensions of the rectangular portion are 8 feet 3 inches in width and 22 feet in height. The hub is 37 inches in diameter and is 18 iuches thick. This frame was so large that it was necessary to use both tracks of the Erie railroad to transport it from Paterson to Jersey City for shipment by boat to Newport News.

## Iron Market and Freight Matters.

There has been considerab'e talk in vessel circles during the past week about some business for next year having been done between ore shippers and vessel owners at $1.10 from the head of the lakes. An effort to close up a few contracts at that figure was made, in good faith, by a Cleveland firm, but nothing resulted from it. Strange as it may seem to ore shippers, who now advance the opinion that a lower range of prices in the iron market and heavy contracts in ship yards will result in dollar freight next season, not a single vessel owner was found ready to accept the offer of $1.10 referred to above. They are still looking for a higher freight, but it mnst be stated, in explanation of the situation, that if vessel owners were willing to accept contracts at $1.10 they would not find ore shippers ready to pay that figure any more than they would pay $1.25. The offer of $1.10, on which it was found later that the ore could not be had, was certainly not based on a sale of ore, as everything in the iron market is against negotiations for sales of ore at this time. Declines in Bessemer pig iron and in all lines of finished material are very marked. Furnaces of Pittsburg and the Mahoning valley have more pig iron than they can market, and speculative iron taken under contract some months ago for December delivery is going on the market at very low prices. Offers of $10.75 in the Mahoning valley are said to have been made by sellers, and it is thought that even this figure has been shaded.

It is now reported from Paris that the hull of the aluminum torpedo boat constructed some time ago by an English firm for the French navy is so corroded in all its parts that the metal can be penetraetd with but slight pressure. The boat is entirely unfit for service. Action of the salt water and sea air is said to be the cause. Orders for small boats of aluminum to be carried by French cruisers have been withdrawn and steel boats will be substituted. German naval officials report a similar experience with small vessels, and our own naval officers are congratulating themselves upon having moved slowly in using the white metal. Its use on the small torpedo boats of the battleship Texas has been a disappointment. The torpedo boats built for the battleship Texas and the armored cruiser Maine will not be supplied to those vessels. The Texas' boats will be used at the Norfolk navy yard for yard purposes and the Maine's boats are now being extensively used at the New York navy yard.

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# The Roberts Boiler Co.

Have built about..... **800 BOILERS TO DATE** for...

Launches, Yachts, Passenger and Freight Steamers, Dredges, Tugs, Stern-Wheelers, Canalers; also for Navy Department, War Department, Treasury Department, Light-House Board and Revenue Cutter Service: also for N. Y. Dock Department and N Y. Harbor Quartermaster.

**...SAFETY AND ECONOMY...**

**Never killed a man or had a serious accident.** $250,000 capital. Works covering 29,000 square feet of ground. Never had a boiler returned on account of dissatisfaction. Every Boiler Warranted. All material made specially for our use. All boilers tested at 500 pounds hydrostatic pressure and 250 pounds of steam before shipping. Workmanship strictly first-class. All joints screwed and reliable. No expanded joints. State your requirements and we will furnish specifications. Correspondence solicited.

**THE ROBERTS SAFETY WATER TUBE BOILER CO.,**
39 and 41 Cortlandt Street, New York City.
Works, Red Bank, N. J.

---

# For Sale A Double Furnace Marine Boiler,

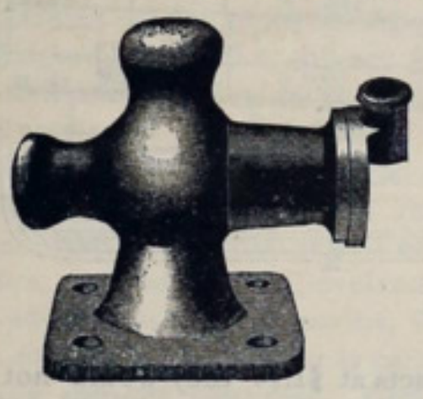
11 feet diameter by 14 feet long, and 120 pounds steam.
In good condition, built by the Globe Iron Works, Cleveland, in 1891.

Address: GOODRICH TRANSPORTATION CO., CHICAGO

---

# Enos Combined Bitt, Winch and Sheet Holder.

**Patented U. S. A., England and Canada.**



Takes the place of wooden or iron bitts and forms a Combination Bitt and Winch. Takes up less room than the ordinary bitt. Can be used to great advantage as a Windlass or Sheet Holder on Yachts. An examination will convince you of the many uses to which it can be put.

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H. Channon Company, Chicago, Ill.
Upson, Walton & Co., Cleveland, Ohio.
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M. I. Wilcox Cordage & Supply Co., Toledo, O.
H. D. Edwards & Co., Detroit, Mich.
Henry Beckman & Son, Erie, Pa.
And by Ship Chandlers in every seaport city lake port and town.

**THE ENOS SHEET HOLDER CO.**
Manufacturers and Proprietors, PEABODY, MASS.

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H. E. STEVENS. J. T. MEAD. LEWIS S. PRESLEY

**BUCKEYE STEAM FITTING CO.** Manufacturers of Improved Giant Flue Scraper.

STEAM FITTERS. ENGINEERS' SUPPLIES.

Phone 4058, 117 River Street, CLEVELAND, OHIO.

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# For Sale Cheap

Several tugs with engines all the way from 10x12 to 20x20 and all in good repair. For full particulars address:

**INMAN TUG LINE,**
B. B. INMAN, Manager, Duluth, Minn.

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# For Sale...

**PASSENGER PROPELLOR**
Suitable for Excursion or Short Route.

Rebuilt in 1893, 126 feet keel, 25 feet beam, 9 feet 6 inches depth of hold, capacity 400 excursionists, speed normal 11 to 12½ miles.

---

# Jeffery's Marine Glue

For Paying Seams of Decks and other purposes.

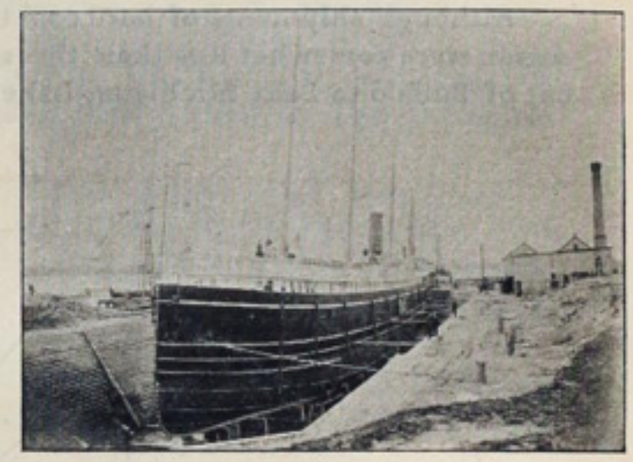
L. W. FERDINAND & CO., Boston, Mass.
Send for Circular.

---

# DUNFORD & ALVERSON,

PORT HURON, MICH.

**Length, 400 feet,**
**Width:**
**On top, 95 feet,**
**Bottom, 55 "**
**Gate, 62 "**
**Depth:**
**To Floor, 20 ft.**
**To Sill, 18 ft.**
**On Blocks, 16 ft.**



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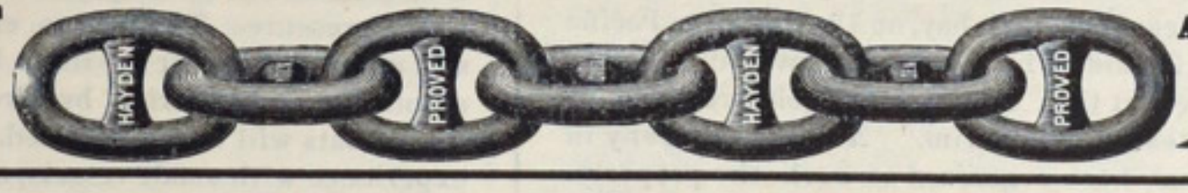


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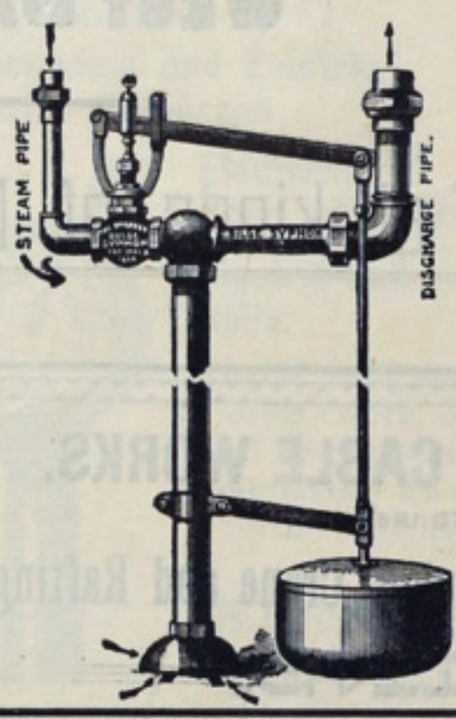


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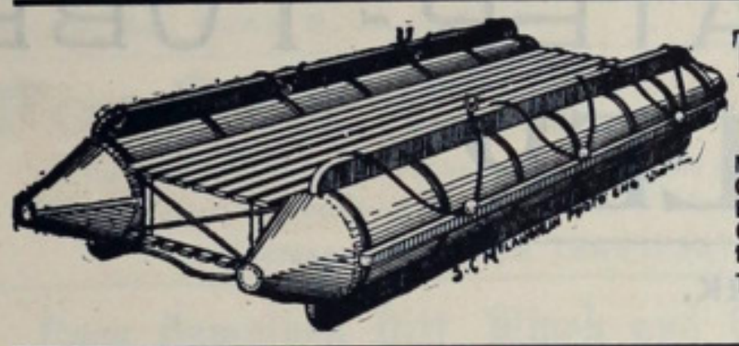

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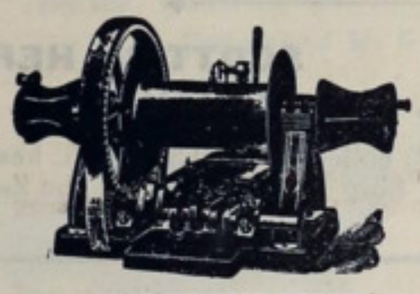

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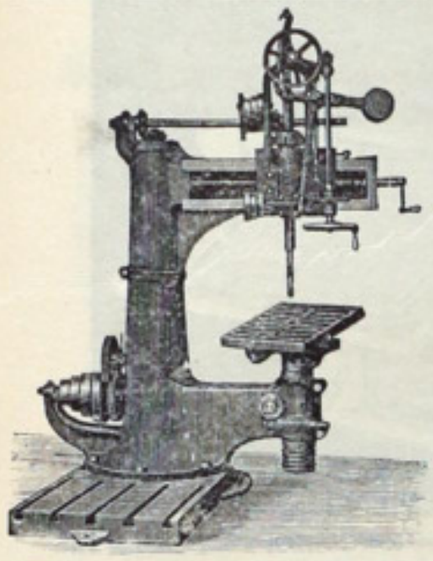

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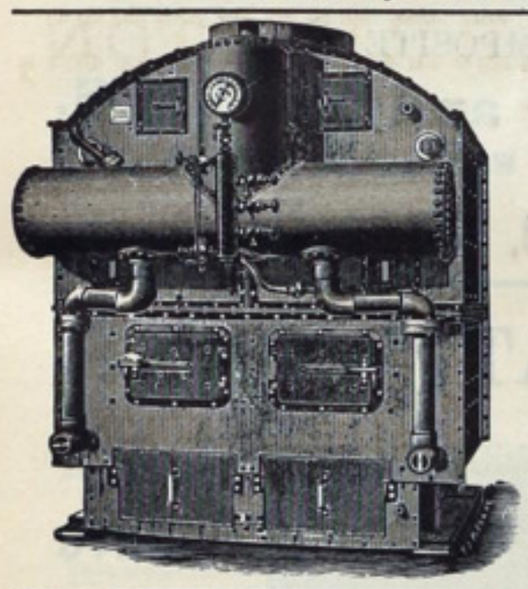

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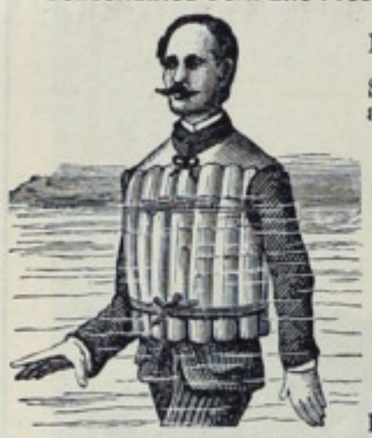

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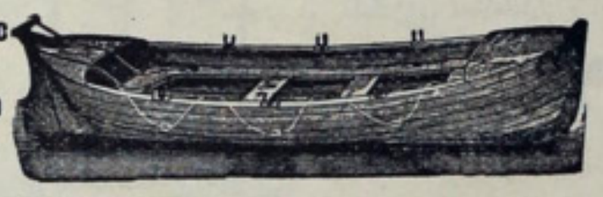

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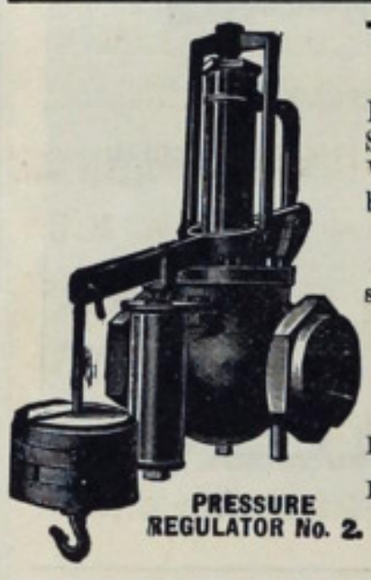

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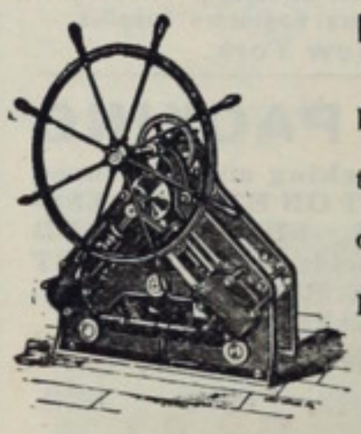

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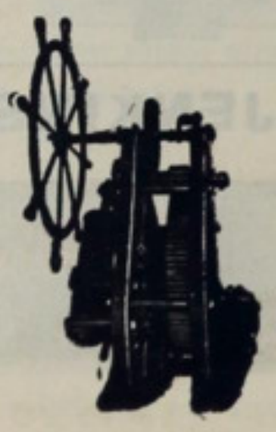

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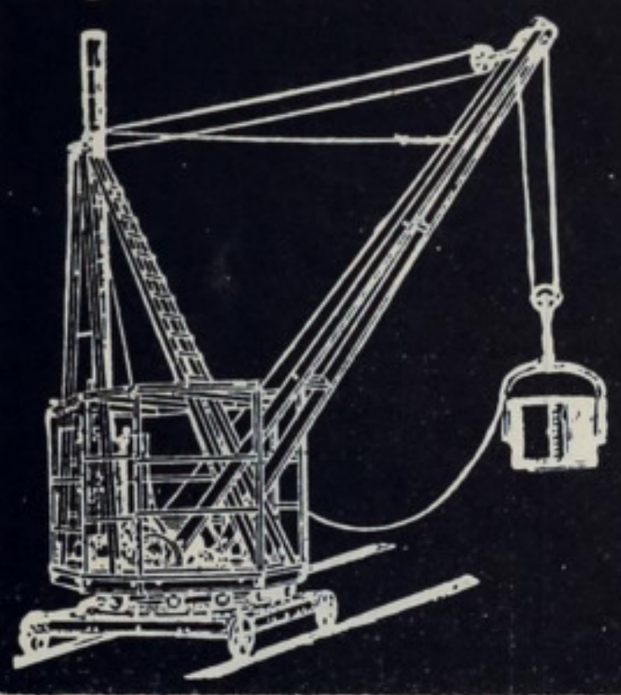

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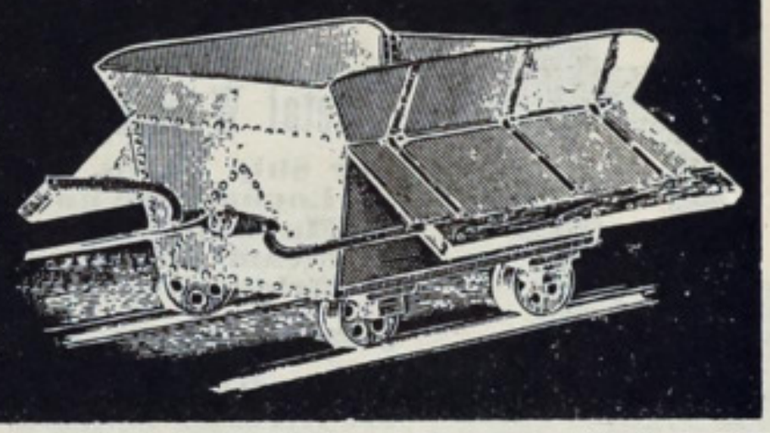

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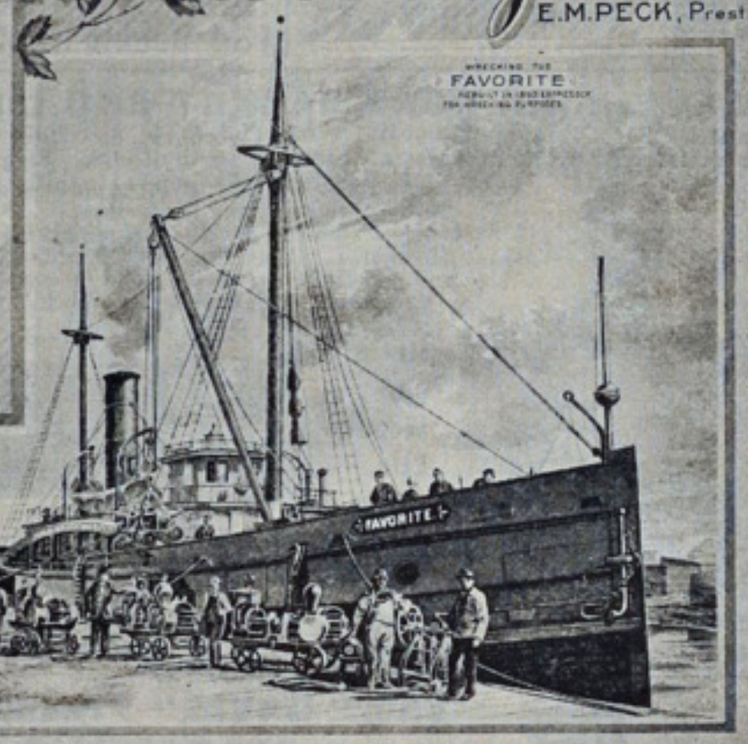


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1-10
1-9

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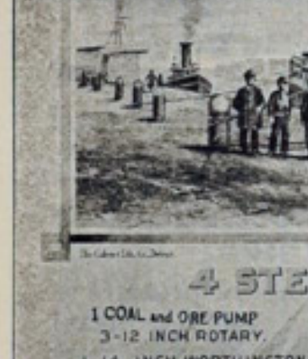

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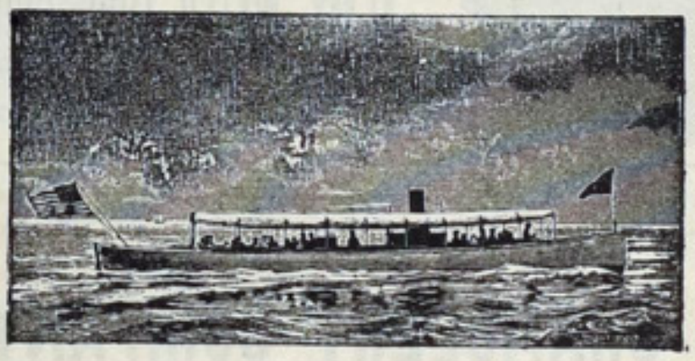

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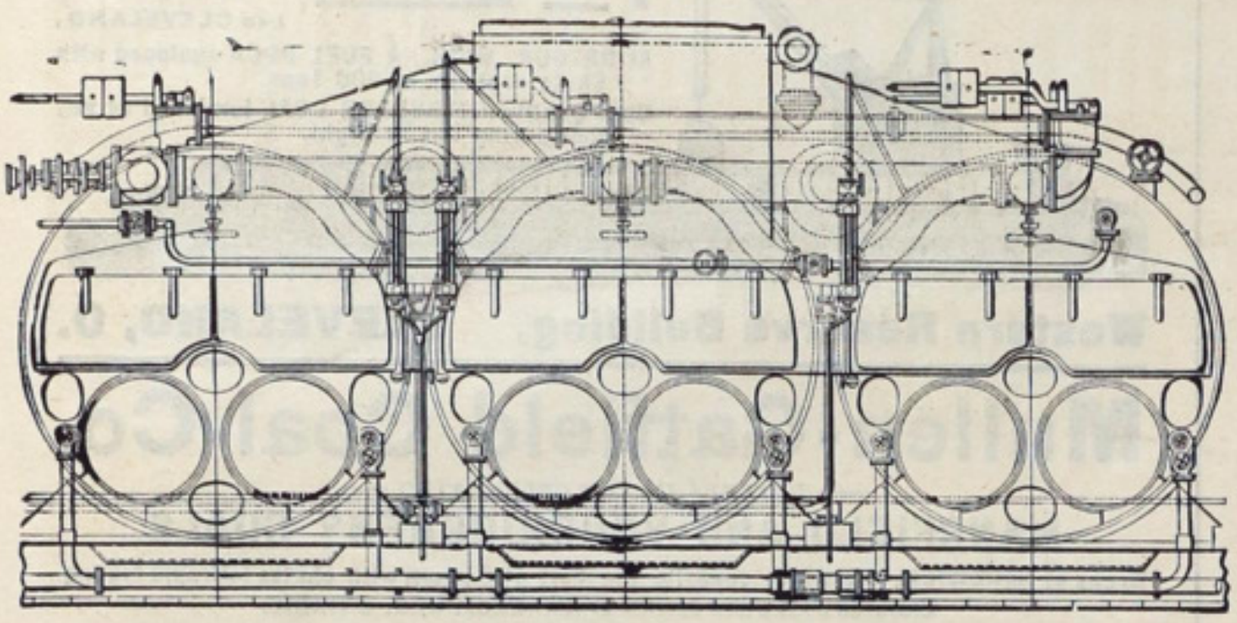

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|---|---|---|---|---|---|---|---|
| | | *Feet.* | *Feet.* | *Feet.* | *Feet.* | *Feet* | |
| Buffalo, N. Y. | Union Dry Dock Co. | 340 | 348 | 58¼ | ..... | 9 | To be 400 feet on blocks and 17 feet over sill. |
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| Chicago, Ill. | Chicago Ship Building Co. (Calumet) | 445 | 470 | 70 | 100 | 18 | |
| Cleveland, Ohio | Ship Owners Dry Dock Co. | 450 | 465 | 50 | ..... | 17 | |
| Cleveland, Ohio | do | 325 | 340 | 55 | ..... | 14 | |
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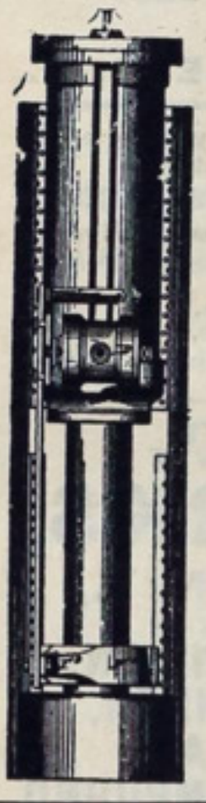

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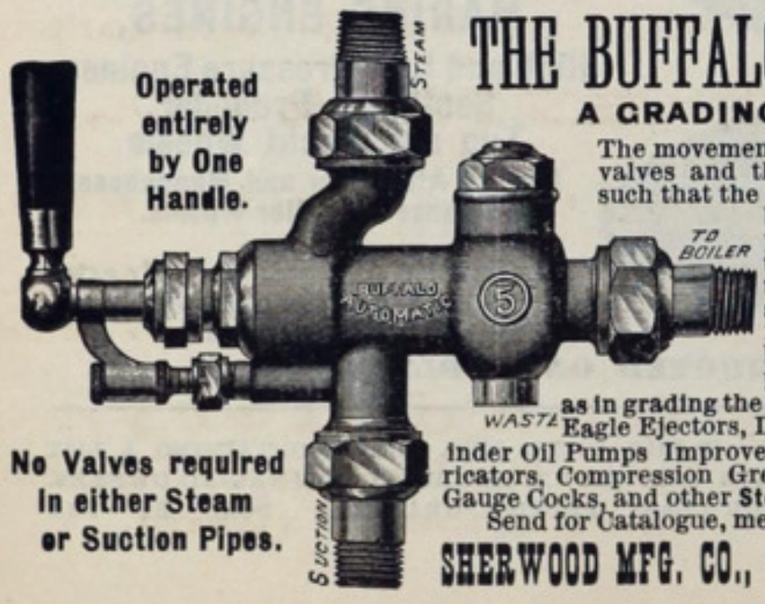


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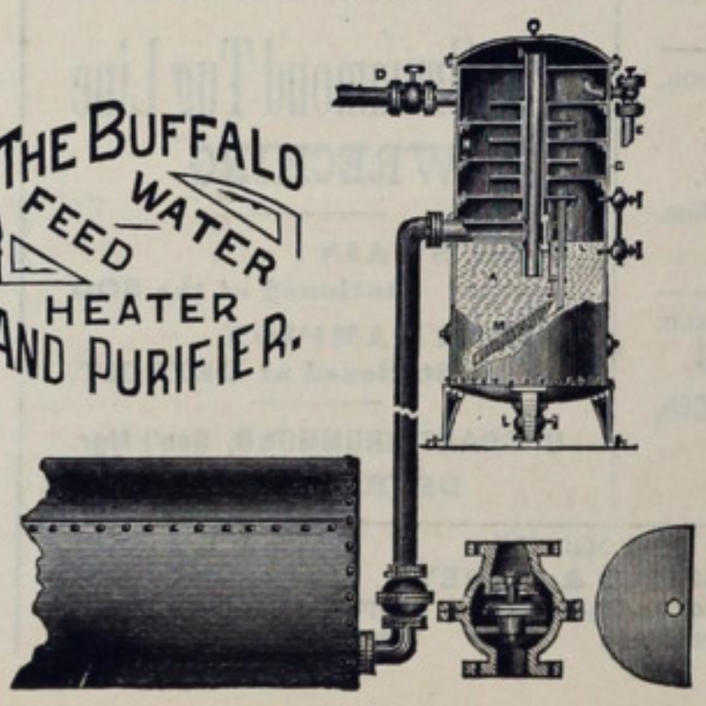

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
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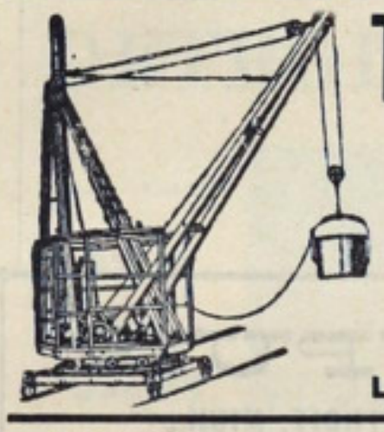

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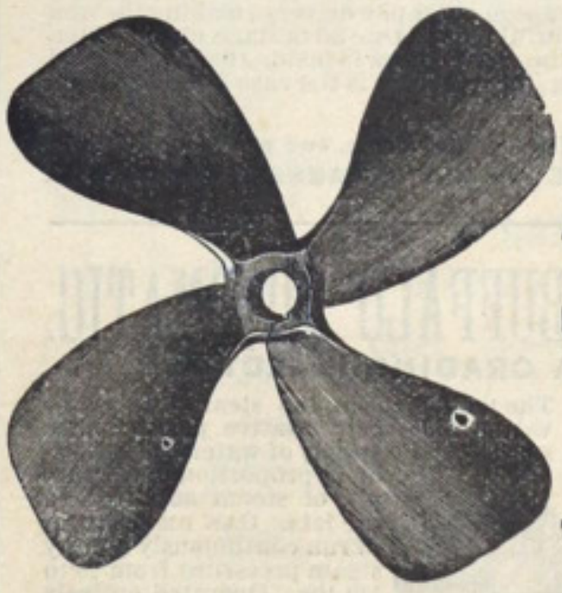

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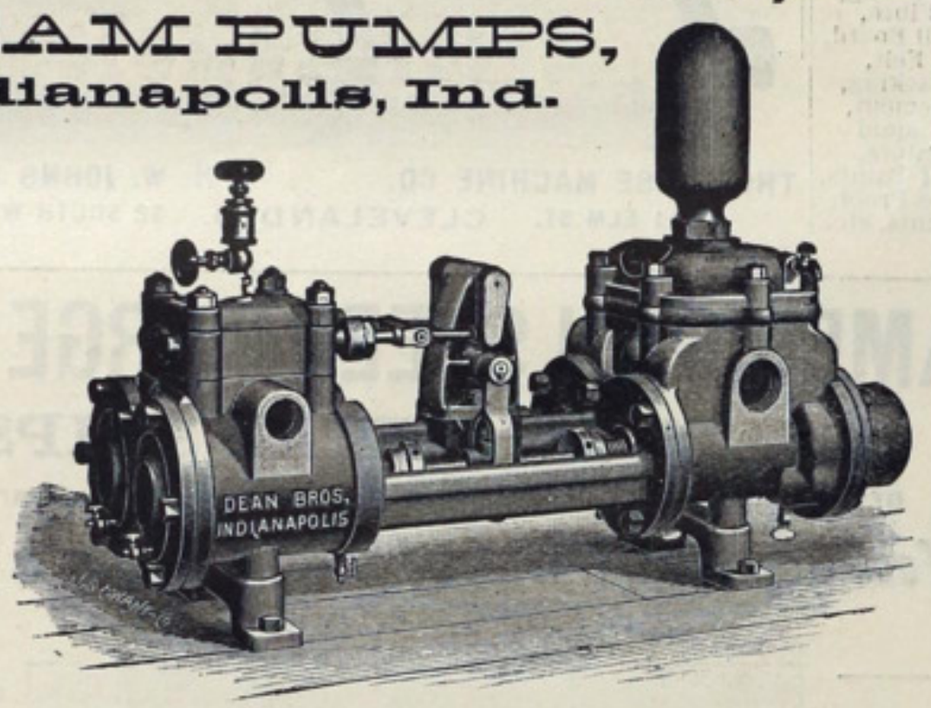


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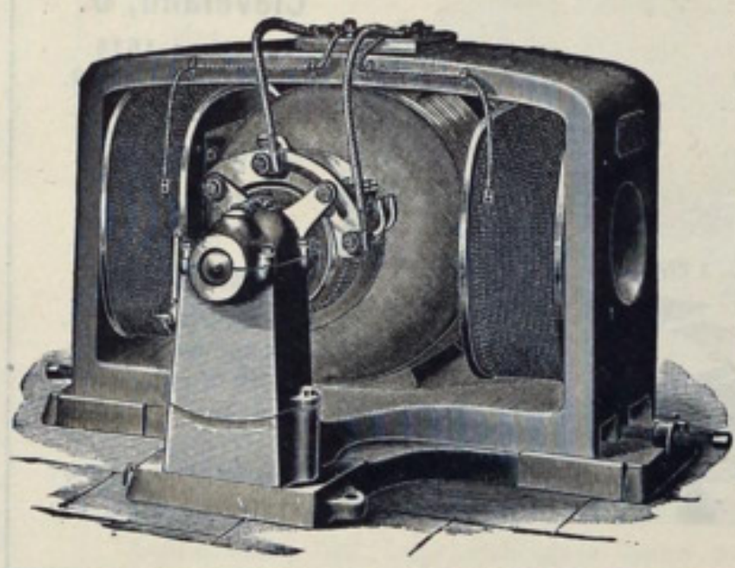

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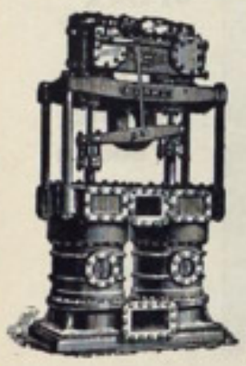

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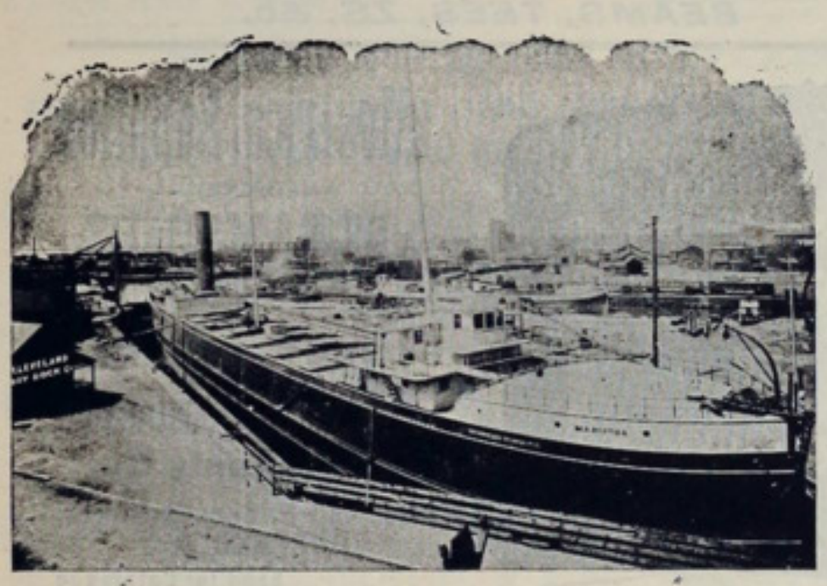

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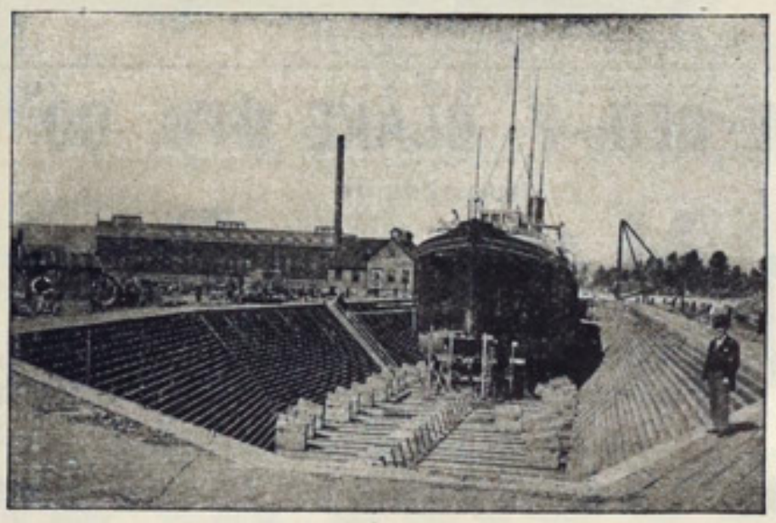

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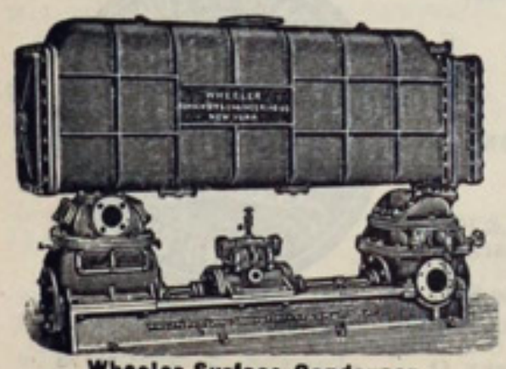
## WHEELER'S IMPROVED SURFACE CONDENSERS

MOUNTED UPON COMBINED AIR AND CIRCULATING PUMPS.

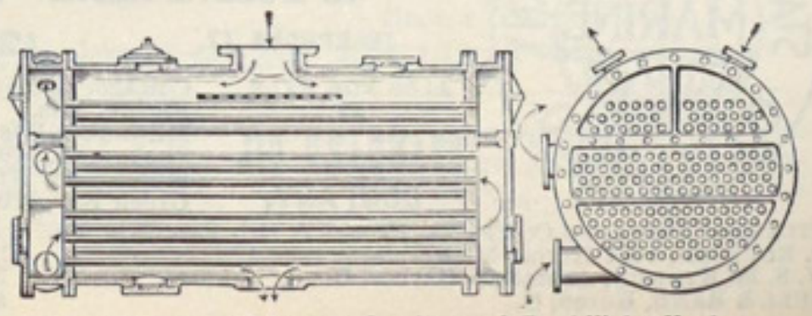
Sole Proprietors and Manufacturers of the

**Wheeler Standard Surface Condenser.**
**Wheeler Admiralty Surface Condenser.**
**Wheeler Lighthall Surface Condenser.**
**Volz Patent Combined Surface Condenser and Feed Water Heater.**



**Wheeler Surface Condenser.**
Mounted on Combined Air & Circulating Pumps.

**Wheeler's Improved Marine Feed Water Heater.**



**Patent Combined Surface Condenser & Feed-Water Heater.**